

1                                   **SYSTEM AND METHOD FOR**  
2                                   **LUBRICANTS SUPPLY CHAIN MANAGEMENT**

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4                                   **I. FIELD OF THE INVENTION**

5  
6       This invention relates to system and method system and method for an  
7       improved Lubricants supply chain

8  
9                                   **II. BACKGROUND OF THE INVENTION**

10  
11       Lubricant products are traditionally sold through wholesale distributors, also  
12       known in the industry as "jobbers". The jobbers have the retail outlet and/or  
13       end-user customer contacts, set or negotiate prices and make deliveries.  
14       Jobbers sell the lubricants to end-users, retail outlets (e.g., Walmart), or  
15       installers (e.g., Jiffy Lube) (collectively "end user" or "end customer"). Jobbers  
16       also often also coordinate or act as an intermediary in any customer service  
17       that may occur. The result is that the lubricant producer and all but a few large  
18       end users have little or no contact.

19  
20       Jobbers typically carry multiple competing brands and selectively match  
21       customer needs with brands. This selection is not necessarily based on the  
22       best lubricant for the end-user's application. Instead, the selection may be  
23       based on available inventory or maximizing profit for the jobber. Thus, this can  
24       mean that the end user may not have access to the lubricant that best suits  
25       their particular needs. They may also pay a premium for the lubricant they buy  
26       to cover the mark-up cost and profit of the jobber's operation. There are also  
27       costs to the lubricants producer associated with maintaining a traditional jobber  
28       network. These costs include maintaining a sales staff, incentive programs,  
29       marketing, and pricing administration.

30  
31       In order to eliminate these administrative costs for the lubricants producer,  
32       provide direct pricing from the lubricants producer to the end customer, and  
33       allow the lubricants producer to control the end customer relationship, a method

1 that facilitates direct sales of lubricants to end customer would be  
2 advantageous.

3  
4 Avoiding these shortcomings of the jobber network system in the past has been  
5 difficult. It was impractical for the lubricants producer to have a direct sales  
6 team sufficiently large to contact end customers directly. Also, the local  
7 delivery of lubricants orders of less than a full truckload was either unavailable  
8 or excessively expensive. Instead, the jobbers handled these local customer  
9 sales administration and delivery functions.

10  
11 With the advent of wide adoption of the Internet and other new information  
12 technology it is now possible to craft a system and method allowing the  
13 lubricants producer to wholly or partially disintermediate the jobber, thus  
14 overcoming previous impediments which necessitated the use of jobbers. The  
15 system and method of the present invention provides such a direct sales  
16 method.

### 17 18 III. SUMMARY OF THE INVENTION

19  
20 The invention includes a method of lubricants supply chain management  
21 including: storing in a web-accessible database a catalog of lubricants and  
22 prices-per-unit for same which prices-per-unit decrease at certain pre-  
23 determined quantity points; upon receiving at a web server a request from a  
24 web-browser client, querying the database and serving the results of the  
25 query to the requesting web-browser client for display; serving one or more  
26 order forms to the web-browser client which contain fields or other selection  
27 means for order quantity and type for lubricants, delivery type preferences  
28 and delivery address entered in the web-browser client, and determining and  
29 displaying on the web-browser client a delivery price quote; receiving an order  
30 from the web-browser client for a specific type and quantity of lubricants and  
31 having a specific delivery type selected; electronically transmitting over a  
32 network the order to an order fulfillment agent; where the order fulfillment  
33 agent electronically transmits over a network the order to at least one  
34 lubricant blender; electronically transmitting over a network the order and the

1 delivery information to a freight-handling agent; where the freight-handling  
2 agent inputs the information into a delivery optimization system which outputs  
3 a delivery schedule which includes the order, and electronically transmits over  
4 a network the order and the delivery information to at least one trucking  
5 company; and maintaining the status and all actions and communications for  
6 the order in a second web-accessible database.

7  
8 In other embodiments the invention includes systems configured and adapted  
9 to perform the steps listed in the above-described methods, and computer  
10 readable media containing computer readable instructions configured and  
11 adapted to perform the steps listed in the above-described methods.

12  
13 These and other features and advantages of the present invention will be  
14 made more apparent through a consideration of the following detailed  
15 description of a preferred embodiment of the invention. In the course of this  
16 description, frequent reference will be made to the attached drawings.

#### 17 18 IV. BRIEF DESCRIPTION OF THE DRAWINGS

19  
20 Fig. 1 is a schematic block system diagram of one embodiment of the  
21 invention.

22  
23 Fig. 2 is a schematic block entity-relationship diagram depicting, in one  
24 embodiment of the invention, the entities participating in the invention and  
25 their relationships.

26  
27 Fig. 3 is a schematic block level 0 flow diagram of one embodiment of the  
28 invention.

29  
30 Figs. 4A and 4B depict in one embodiment of the invention, schematic  
31 diagrams of the Lubricants Ordering step of the method and system of the  
32 invention.

1 Fig. 5 depicts in one embodiment of the invention, a hybrid schematic block  
2 diagram combining aspects of an entity-relationship diagram, messages and  
3 data passing between the entities and the order of such events.

4  
5 Fig. 6 depicts in one embodiment of the invention, a conceptual data model  
6 for implementing the database aspects of the invention.

## 7 8 V. DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

### 9 10 A. Introduction

11  
12 The following discussion and figures include a general description of a  
13 suitable computing environment in which the invention may be implemented.  
14 While the invention will be described in the general context of an application  
15 program that runs on an operating system in conjunction with a personal  
16 computer, those skilled in the art will recognize that the invention also may be  
17 implemented in combination with other program modules. Generally, program  
18 modules include routines, programs, components, data structures, etc. that  
19 perform particular tasks or implement particular abstract data types.  
20 Moreover, those skilled in the art will appreciate that the invention may be  
21 practiced with other computer system configurations, including hand-held  
22 devices, multiprocessor systems, microprocessor-based or programmable  
23 consumer electronics, minicomputers, mainframe computers, and the like.  
24 The invention may also be practiced in distributed computing environments  
25 where tasks are performed by remote processing devices that are linked  
26 through a communications network. In a distributed computing environment,  
27 program modules may be located in both local and remote memory storage  
28 devices.

29  
30 Then invention generally relates to a B2B e-commerce business. Basic  
31 components of such a business include: all of the software which will create a  
32 store operation, a product catalog (where the online customers select what  
33 they want to order), a shopping cart (where product selections are collected),  
34 and transaction security (e.g., credit authorization).

1 Referring now to the drawings, in which like numerals represent like elements  
2 throughout the several figures, aspects of the present invention and a suitable  
3 operating environment will be described.

#### 4 5 B. System 6

7 FIG. 1 is a schematic block system diagram of one embodiment of the  
8 invention. Each entity involved in the method, in one embodiment, is depicted.  
9 The web server for Lubricants Supply Chain Manager 105 ("Lubes SCM") is  
10 connected with Financial System 106, Lubricants Availability DB 110a,  
11 Lubricants Catalog DB 110b ("Lubes DB"), Transactions Database 107, and  
12 Lubricants Applications and Technical Information DB 110c. Lubes SCM 105,  
13 Customer 115, Order Fulfillment Agent 125, Lubricant Blender 130, Freight  
14 Handling Agent 140, Trucking Company 145, Other Service Providers 150,  
15 and Credit Bureaus 155, are each connected to a Network 120.

16  
17 The relationships between these entities are provided in Fig. 2. Network 120  
18 is optionally the Internet or other public or private networks or combinations  
19 thereof. The communication of all entities through a common Network 120 is  
20 illustrative only, and the invention includes embodiments where some entities  
21 communicate through one network, other entities through a different network,  
22 and various permutations thereof. That is, the Lubricants SCM Server 105, as  
23 well as any general-purpose computers utilized by Customers 115 and other  
24 entities (collectively, the "nodes") preferably transmit digitally encoded data  
25 and other information between one another. The communication links  
26 between the nodes preferably comprise a cable, fiber or wireless link on which  
27 electronic signals can propagate. For example, each node may be connected  
28 via an Internet connection using a public switched telephone network (PSTN),  
29 such as those provided by a local or regional telephone operating company.  
30 Alternatively, each node may be connected by dedicated data lines, cellular,  
31 Personal Communication Systems ("PCS"), microwave, or satellite networks.

32  
33 FIG. 2 is a schematic diagram depicting a conceptual data model / entity-  
34 relationship diagram. It shows the key entities of one embodiment of the

1 invention and their interrelationships and key messages transferring between  
2 the entities in the practice of the method and system of the invention.  
3  
4 The diagram is described in the context of an example for one embodiment of  
5 a method/process according to the invention. One or more Customers 115  
6 view an on-line catalog served by Lubes SCM 105. Customers 115 optionally  
7 request a freight price quote on a contemplated order through SCM 105 who  
8 communicates the request to Freight Handling Agent 140. Freight Handling  
9 Agent 140 processes the request and returns a quote through SCM 105 to  
10 Customer 115. Customer 115 then passes an order to Lubes SCM 105. If  
11 purchase on credit is requested by Customer 115, then before accepting the  
12 order, Lubes SCM 105 passes Customer information to one or more internal  
13 or external Credit Bureaus 155 for a credit evaluation.  
14  
15 If the order is accepted, Lubes SCM 105 passes the order to Order Fulfillment  
16 Agent 125 and optionally simultaneously to Lubricants Blender 130. Order  
17 Fulfillment Agent 125 notifies Lubes SCM 105 of acceptance or rejection of  
18 the order. If accepted, Order Fulfillment Agent 125 passes order information  
19 to one or more Lubricants Blenders 130, if not previously done by SCM 105,  
20 and SCM 105 passes order to Freight Handling Agent 140. Freight Handling  
21 Agent 140 processes the order in a delivery schedule optimization system to  
22 determine a pick-up and delivery schedule for the order. When determined,  
23 the schedule is passed to one or more Trucking Companies 145. One or  
24 more Trucking Companies 145 provide pick-up and delivery services from one  
25 or more Lubricants Blenders 130 to one or more Customers 115.  
26  
27 Lubricants Blender 130 manufactures the products required for the order and  
28 prepares them for shipping. Except where Customer 115 picks up the  
29 Lubricants itself, Trucking Companies 145 pick up the products and deliver  
30 them to Customer 115. Trucking Companies 145 notifies Freight Handling  
31 Agent 140, and optionally Lubes SCM 105 of delivery. Lubes SCM 105 then  
32 bills Customer 115 for the order. Customer 115 makes payment to Lubes  
33 SCM 105 for the order and the freight charges, or optionally pays freight

charges directly to Freight Handling Agent 140 or Trucking Companies 145 (not shown).

Where Customers 115 order services, Lubes SCM 105 passes the order to one or more Other Service Providers 150. One or more Other Service Providers 150 serve one or more Customers 115. Notification of completion of services, and billing and payment is similar to that described above for products.

#### D. Method

The method/process aspect of the invention is illustrated and described in Figs. 3 and 4 as a series of process steps. As would be clear to one skilled in the art, the process steps can be embodied as code for a computer program for operation on a conventional programmed digital computer, such as a client (Customer 115) and server (Lubricants SCM Server 105) (each shown in FIG. 1). The program code can be embodied as a computer program on a computer-readable storage medium or as a computer data signal in a carrier wave transmitted over Network 120 (shown in FIG. 1).

Fig. 3 is a schematic block level 0 flow diagram<sup>1</sup> of one embodiment of the invention. Customer 115 (shown in Fig. 2) logs in (step 305) to Lubes SCM 105 web site and selects (step 310) the Lubricants Ordering System 315. Thereafter, the Customer may select the Freight Quote System 320, and/or Service Ordering System 325. Thus, Customer 115 must first enter Lubricants Ordering System 15, before being permitted the option of then entering Freight Quote System or Service Ordering System 325. In an alternate embodiment, each of these systems is integral with and/or accessible from all other services or portions thereof.

Further detail of the log-on procedure 305 follows: Typically the user will begin log on by selecting a button. A log on screen will then be displayed. The content of the log on screen is preformatted except for the user entries which are to be entered in any data input fields. An example of an input field

1 is a userid. After a user has entered in the field an acceptable input, he would  
2 then click on a submit button. At this point the Web server captures the  
3 information entered by the user. It will be appreciated that the Web server of  
4 the Lubricants Ordering System 315 captures the information entered by the  
5 user, including specialized input, as well as any "hidden" default information,  
6 which can include password authorizations, charge account identification, and  
7 other information that can be used by the system responding to the request.  
8 Thus the system can assume that the "hidden" password is an authorization  
9 to perform some function, such as include information from confidential  
10 source, or exit to the Internet. An acknowledgement of successful sign-on is  
11 displayed, if successful.

12  
13 A customer may log on using a typical personal computer system or  
14 workstation system. Such a system would include typical components such  
15 as a bus for communicating information, and a processor coupled with the bus  
16 for processing information, random access memory, coupled to the bus for  
17 storing information and instructions to be executed by the processor. RAM  
18 also may be used for storing temporary variables or other intermediate  
19 information during execution of instructions by the processor, a read only  
20 memory coupled to the bus for storing static information and instructions for  
21 the processor, and a data storage device coupled to the bus for storing  
22 information and instructions. The data storage device may include a magnetic  
23 disk or optical disk and its corresponding disk drive can be coupled to the  
24 computer system. Also the system may be coupled via the bus to a display  
25 device, such as a cathode ray tube, for displaying information to a computer  
26 user. The computer system further includes a keyboard and a cursor control,  
27 such as a mouse. Any other access devices for accessing a network are  
28 intended to be included in the invention. Such devices include properly  
29 equipped and configured cellular phones and personal digital assistants.

30  
31 While the preferred network is the Internet, other networks may be used,  
32 preferably capable of transmitting using Transmission Control  
33 Protocol/Internet Protocol and Hyper-Text Transfer Protocol. The  
34 communication links between the entities for implementing the network



1 preferably comprises a cable, fiber or wireless link on which electronic signals  
2 can propagate. For example, each entity may be connected via an Internet  
3 connection using a public switched telephone network such as those provided  
4 by a local or regional telephone operating company. Alternatively, each entity  
5 may be connected by dedicated data lines, cellular, Personal Communication  
6 Systems, microwave, or satellite networks.

7  
8 Fig. 4 depicts in one embodiment a schematic diagram of Lubricants Ordering  
9 step 315 of the process. The initial step is to Display Lubricants Catalog To  
10 Customer (step 405). From this display, Customer 115 selects Lubricants  
11 Products (step 410). This step optionally includes also selecting offered  
12 services, credit request, freight type, and other options. Customer 115 then  
13 transmits such selections to the Lubes SCM 105 (step 415). Upon receiving  
14 the order (and optionally approving credit and/or accepting the order), Lubes  
15 SCM 105 passes the order information to Order Fulfillment Agent 125 (step  
16 420).

17  
18 Order Fulfillment Agent 125 notifies Lubes SCM 105 of order acceptance  
19 (step 425) and then SCM 105 passes the order information to Freight  
20 Handling Agent 140 (step 430). Passing the order information to Freight  
21 Handling Agent 140 is optional since the Customer may opt to pick up the  
22 order directly (step 432) rather than pay for delivery. If the Customer chooses  
23 delivery, then Freight Handling Agent 140 enters the order information into a  
24 scheduling application, which returns a pick-up and deliver schedule for the  
25 order (step 435). This step allows efficient and economical use of trucking  
26 space since otherwise delivery of partial truckloads would be impracticable.  
27 The scheduling application overcomes this by combining partial loads and  
28 otherwise managing multiple pick-ups and deliveries to optimize the schedule,  
29 e.g., least distance traveled, most full trucks, least expensive route. Such  
30 scheduling systems are available commercially from i2 Technologies located  
31 at One i2 Place, 11701 Luna Road, Dallas, Texas 75234 USA, and as  
32 described in more detail at its website, <http://www.i2.com>.

1 The ability of the Freight Handling Agent 140 to combine multiple orders from  
2 multiple manufacturers of multiple products in a delivery schedule optimization  
3 system overcomes in part the prior impracticality of the lubricants producer  
4 arranging delivery of partial truck loads of packaged lubricants. A full  
5 truckload may be formed from a variety of partial truckloads of products from  
6 different industries, e.g., lubricants, automobile parts, and consumer  
7 commodities. Such delivery schedule optimization systems are available  
8 commercially (e.g., from I2 Technologies as noted above) and/or can be  
9 created by those skilled in the art. Often such systems employ genetic  
10 algorithms for computing multiple variations of pick-up and delivery schedules,  
11 test each schedule against a fitness-factor, e.g., fewest total miles or lowest  
12 cost or maximum profit, use the top rating schedules to form new schedules,  
13 re-rank those schedules, and so forth until a sufficiently satisfactory schedule  
14 is determined.

15  
16 Thus, genetic algorithms attempt to simulate natural selection by selecting the  
17 most fit schedules from which to produce new schedules (offspring). Typically  
18 several generations of schedules may be produced before one meets the  
19 termination criteria. Genetic algorithms are described in U.S. Pat. No.  
20 6,182,057 entitled Device, Method, And Program Storage Medium For  
21 Executing Genetic Algorithm, which is incorporated herein by reference in its  
22 entirety. Non-patent information includes, e.g., Introduction to Genetic  
23 Algorithms, (see <http://lancet.mit.edu/~mbwall/presentations/IntroToGAs/>).  
24 Commercially available genetic algorithm programs include Gene Hunter <sup>TM</sup>  
25 from Ward Systems Group Inc. (see <http://wardsystems.com>).

26  
27 Preferably the order page presented to the Customer 115 includes a truck  
28 graphic which shows various truck load states. For example, the first state of  
29 the graphic is empty, the second state less than 35 percent full, the third state  
30 between 35 and 95 percent full, and the fourth state greater than 95 percent  
31 full. These states preferably are graphically presented, e.g., via increasing  
32 the amount of dark or hatched space proportional to the white space, the  
33 hatched space indicating the loaded portion of the truck and the white space  
34 indicating the empty portion of the truck.

1 A separate message may be presented next to each state informing the  
2 Customer 115 of the freight cost efficiency of the order, i.e., freight cost per  
3 unit or per unit of weight. The efficiency would improve as the truck filled up.  
4 In practice, a one-third or one-half full truck might be charged the same price  
5 as a full truck. Once the full truckload freight rate is reached, Customer 115  
6 would see freight cost efficiency increase as additional products are ordered,  
7 as additional units would not increase freight costs.

8  
9 Freight Handling Agent 140 then passed the order and schedule information  
10 to Trucking Companies 145 (step 437). Trucking Companies 145 loads the  
11 products specified in the order at the Lubricants Blender's 130 facility and  
12 deliver it to Customer 115 (step 440). Trucking Companies 145 notifies  
13 Freight Handling Agent 140 and optionally Lubes SCM 105 of the completed  
14 delivery (step 445). Lubes SCM 105 settles the order with Customer 115  
15 (step 450). This is by various alternate methods, e.g., by billing the Customer  
16 115 and then receiving payment or by other agreed upon methods, including  
17 credit card, electronic payment, or other existing or future developed account  
18 settlement means.

19  
20 Since the purchaser-specific order information contains sensitive information  
21 (e.g., a credit card number), both vendors and purchasers want to ensure the  
22 security of such information. Security is a concern because information  
23 transmitted over the Internet may pass through various intermediate computer  
24 systems on its way to its final destination. The information could be  
25 intercepted by an unscrupulous person at an intermediate system. To help  
26 ensure the security of the sensitive information, various encryption techniques  
27 are used when transmitting such information between a client computer  
28 system and a server computer system. Even though such encrypted  
29 information can be intercepted, because the information is encrypted, it is  
30 generally useless to the interceptor.

31  
32 Along the way, the output can be coupled to an auxiliary function, such as  
33 back-up or accounting processes (e.g., Financial System 106 and Transaction  
34 database 107 per Fig. 1) which allow for service charges for services and

1 items requested. These processes will make use of hidden variables  
2 associated with the request, such as charge authorization. one of the hidden  
3 variables which may be associated with a request is a credit card number.  
4 The credit card number, is preferably encrypted, with a DES or RSA  
5 encryption utility, and this along with access authorization variables, will allow  
6 access to sensitive databases which reside behind firewalls. If selected data  
7 according to the request is permitted to the access authorized user at the  
8 location side or outside the Internet, the data can be included in the results  
9 reported by the system to the web browser.

10

11 The selection of the various items from the electronic catalogs is generally  
12 based on the "shopping cart" model. When the purchaser selects an item  
13 from the electronic catalog, the server computer system metaphorically adds  
14 that item to a shopping cart. When the purchaser is done selecting items,  
15 then all the items in the shopping cart are "checked out" (i.e., ordered) when  
16 the purchaser provides billing and shipment information. In some models,  
17 when a purchaser selects any one item, then that item is "checked out" by  
18 automatically prompting the user for the billing and shipment information.

19

20 Fig. 5 depicts in one embodiment of the invention, a hybrid schematic block  
21 diagram combining aspects of an entity-relationship diagram, messages and  
22 data passing between the entities and the order of such events. The circles  
23 represent entities involved in the method of the invention. The directed arcs  
24 between the circles represent directions of message flows between the  
25 entities. The boxes attached to the directed arcs show the nature of the  
26 message contents. The message boxes are numbered to show the typical  
27 order, in one embodiment, in which the message passing occurs.

28

29 In message box 1, a registration and/or order form are passed from  
30 Lubricants SCM 105 to Customer 115. The Customer passes an online  
31 message for an order back to Lubricants SCM 105 (not shown), or in  
32 message box 1B, passes a order via telephone to Lubricants SCM Customer  
33 Service 109. Lubricants SCM 105 obtains real-time freight quote from Freight  
34 Handling Agent 140 (message box 2). Lubricants SCM Customer Service

1 109 enter the order with Lubricants SCM 105 (message box 1.1B). Lubricants  
2 SCM 105 passes an online or telephonic order confirmation to Customer 115  
3 (message box 3).  
4  
5 Lubricants SCM 105 passes order notification to Order Fulfillment Agent 125  
6 and Lubricants Blender 130 (message boxes 4 and 4A). Lubricants Blender  
7 130 obtains Formulas and Specifications as needed from Order Fulfillment  
8 Agent 125 (message box 4B). Lubricants Blender 130 passes order  
9 acknowledgement to Lubricants SCM 105 (message box 5). Lubricants SCM  
10 105 passes order notification to Freight Handling Agent 140 (message box  
11 6). SCM Customer Service 109 notifies Customer 115 that the order is ready  
12 to ship (message box 6A). Freight Handling Agent 140 notifies  
13 Trucking Companies 145 of shipping requirements (message box 7). If  
14 Customer 115 pick-up order directly, then pick up information is exchanged  
15 with Lubricants Blender 130 (message box 7A) and messages 8 and 9 are  
16 skipped.  
17  
18 Otherwise, Trucking Companies 145 schedules order pick-up with Lubricants  
19 Blender 130 (message box 8). Trucking Companies 145 schedules delivery  
20 with Customer 115 (message box 9). Lubricants SCM 105 passes the order  
21 shipped message to Customer 115 (message box 11). Trucking Companies  
22 145 sends delivery confirmation to Freight Handling Agent 140 (message box  
23 12).  
24  
25 Freight Handling Agent 140 passes delivery notification with delivery fees  
26 information to Lubricants SCM 105 (message box 13). Lubricants SCM 105  
27 passes pre-tax order data to Financial System 106 (message box 14).  
28 Financial System 106 generates and passes invoice for the order to  
29 Lubricants SCM 105 (message box 15). Lubricants SCM 105 passes invoice  
30 to Customer 115 (message box 16).  
31  
32 Fig. 6 depicts in one embodiment of the invention, a conceptual data model  
33 for implementing databases described herein. This simplified data model  
34 depicts exemplary key tables used in implementing the databases required for

1 use of the invention. Customer Table 115 contains customer data such as  
2 customer ID, Name and Contact Info. Order Table 510 contains order data  
3 such as order ID, Customer ID, Lube Blender ID, Product ID, and quantity.  
4 The table optionally is configured to contain multiple Lube Blender ID, Product  
5 ID, and quantity attributes.

6  
7 Lube Blender Table 130 contains information such as Lube Blender ID, name,  
8 and contact info. Product Table 520 contains product info. such as Product  
9 ID, Lube Blender ID for blenders capable of blending that product, and  
10 product descriptions.

11  
12 Customer ID is the key attribute for Customer Table 115. Customer ID is also  
13 the shared attribute linking Customer Table 115 with Order Table 510. Order  
14 ID is the key attribute for Order Table 510. The table is linked via shared  
15 attributes Lube Blender ID and Product ID with Lube Blender Table 130 and  
16 Products Table 520, respectively. Product Table 520 and Lube Blender  
17 Tables 130 have Product ID and Lube Blender ID as there respective key  
18 attributes. Products Table 520 is linked to Lube Blender Table 130 via shared  
19 attribute Lube Blender ID.

20  
21 Fig. 6 is only one exemplary data model. Modification of the shown tables as  
22 well as additional tables, their domains, keys, and links to other tables, and  
23 associated queries and reports, and appropriate normalization of each, useful  
24 in implementing the databases used in the invention, given the disclosure  
25 herein, could be implemented by data base designers of ordinary skill in the  
26 art.

## 27 E. Other Implementation Details

### 28 1. Terms

29  
30  
31  
32 The detailed description contained herein is represented partly in terms of  
33 processes and symbolic representations of operations by a conventional  
34 computer. The processes and operations performed by the computer include

1 the manipulation of signals by a processor and the maintenance of these  
2 signals within data packets and data structures resident in one or more media  
3 within memory storage devices. Generally, a "data structure" is an  
4 organizational scheme applied to data or an object so that specific operations  
5 can be performed upon that data or modules of data so that specific  
6 relationships are established between organized parts of the data structure.

7  
8 A "data packet" is type of data structure having one or more related fields,  
9 which are collectively defined as a unit of information transmitted from one  
10 device or program module to another. Thus, the symbolic representations of  
11 operations are the means used by those skilled in the art of computer  
12 programming and computer construction to most effectively convey teachings  
13 and discoveries to others skilled in the art.

14  
15 For the purposes of this discussion, a process is generally conceived to be a  
16 sequence of computer-executed steps leading to a desired result. These  
17 steps generally require physical manipulations of physical quantities. Usually,  
18 though not necessarily, these quantities take the form of electrical, magnetic,  
19 or optical signals capable of being stored, transferred, combined, compared,  
20 or otherwise manipulated. It is conventional for those skilled in the art to refer  
21 to representations of these signals as bits, bytes, words, information, data,  
22 packets, nodes, numbers, points, entries, objects, images, files or the like. It  
23 should be kept in mind, however, that these and similar terms are associated  
24 with appropriate physical quantities for computer operations, and that these  
25 terms are merely conventional labels applied to physical quantities that exist  
26 within and during operation of the computer.

27  
28 It should be understood that manipulations within the computer are often  
29 referred to in terms such as issuing, sending, altering, adding, disabling,  
30 determining, comparing, reporting, and the like, which are often associated  
31 with manual operations performed by a human operator. The operations  
32 described herein are machine operations performed in conjunction with  
33 various inputs provided by a human operator or user that interacts with the  
34 computer.

## 2. Hardware

It should be understood that the programs, processes, methods, etc. described herein are not related or limited to any particular computer or apparatus, nor are they related or limited to any particular communication architecture. Rather, various types of general purpose machines may be used with program modules constructed in accordance with the teachings described herein. Similarly, it may prove advantageous to construct a specialized apparatus to perform the method steps described herein by way of dedicated computer systems in a specific network architecture with hard-wired logic or programs stored in nonvolatile memory, such as read only memory.

## 3. Program

In the preferred embodiment, the steps of the present invention are embodied in machine-executable instructions. The instructions can be used to cause a general-purpose or special-purpose processor which is programmed with the instructions to perform the steps of the present invention. Alternatively, the steps of the present invention might be performed by specific hardware components that contain hardwired logic for performing the steps, or by any combination of programmed computer components and custom hardware components.

The foregoing system may be conveniently implemented in a program or program module(s) that is based upon the diagrams and descriptions in this specification. No particular programming language has been required for carrying out the various procedures described above because it is considered that the operations, steps, and procedures described above and illustrated in the accompanying drawings are sufficiently disclosed to permit one of ordinary skill in the art to practice the present invention.

Moreover, there are many computers, computer languages, and operating systems which may be used in practicing the present invention and therefore



1 no detailed computer program could be provided which would be applicable to  
2 all of these many different systems. Each user of a particular computer will be  
3 aware of the language and tools which are most useful for that user's needs  
4 and purposes.

5  
6 The invention thus can be implemented by programmers of ordinary skill in  
7 the art without undue experimentation after understanding the description  
8 herein.

#### 10 4. Product

11  
12 The present invention may be provided as a computer program product which  
13 may include a machine-readable medium having stored thereon instructions  
14 which may be used to program a computer (or other electronic devices) to  
15 perform a process according to the present invention. The machine-readable  
16 medium may include, but is not limited to, floppy diskettes, optical disks,  
17 CD-ROMs, and magneto-optical disks, ROMs, RAMs, EPROMs, EEPROMs,  
18 magnet or optical cards, or other type of media/machine-readable medium  
19 suitable for storing electronic instructions. Moreover, the present invention  
20 may also be downloaded as a computer program product, wherein the  
21 program may be transferred from a remote computer (e.g., a server) to a  
22 requesting computer (e.g., a client) by way of data signals embodied in a  
23 carrier wave or other propagation medium via a communication link (e.g., a  
24 modem or network connection).

#### 26 5. Components

27  
28 The major components (also interchangeably called aspects, subsystems,  
29 modules, functions, services) of the system and method of the invention, and  
30 examples of advantages they provide, are described herein with reference to  
31 the figures. For figures including process/means blocks, each block,  
32 separately or in combination, is alternatively computer implemented, computer  
33 assisted, and/or human implemented. Computer implementation optionally  
34 includes one or more conventional general purpose computers having a

1 processor, memory, storage, input devices, output devices and/or  
2 conventional networking devices, protocols, and/or conventional client-server  
3 hardware and software. Where any block or combination of blocks is  
4 computer implemented, it is done optionally by conventional means, whereby  
5 one skilled in the art of computer implementation could utilize conventional  
6 algorithms, components, and devices to implement the requirements and  
7 design of the invention provided herein. However, the invention also includes  
8 any new, unconventional implementation means.

## 10 6. Web Design

12 Any web site aspects/implementations of the system include conventional  
13 web site development considerations known to experienced web site  
14 developers. Such considerations include content, content clearing,  
15 presentation of content, architecture, database linking, external web site  
16 linking, number of pages, overall size and storage requirements,  
17 maintainability, access speed, use of graphics, choice of metatags to facilitate  
18 hits, privacy considerations, and disclaimers.

## 20 7. Other Implementations

22 Other embodiments of the present invention and its individual components will  
23 become readily apparent to those skilled in the art from the foregoing detailed  
24 description. As will be realized, the invention is capable of other and different  
25 embodiments, and its several details are capable of modifications in various  
26 obvious respects, all without departing from the spirit and the scope of the  
27 present invention. Accordingly, the drawings and detailed description are to  
28 be regarded as illustrative in nature and not as restrictive. It is therefore not  
29 intended that the invention be limited except as indicated by the appended  
30 claims.